INSPECTION AND ACCEPTANCE OF CORROSION INHIBITORS FOR PORTLAND CEMENT CONCRETE

GENERAL

Corrosion inhibitors may be used to reduce or prevent corrosion of steel reinforcement embedded in concrete. Corrosion inhibitors for Portland Cement Concrete shall meet the requirements of applicable Iowa Department of Transportation Specifications.

ACCEPTANCE

Acceptance of corrosion inhibitors for use on Iowa Department of Transportation projects will be on the basis of manufacturer and brand name approval.

For all approved corrosion inhibitors, the source, brand name and lot number must be identifiable by marking on the container and by description on the invoice. The manufacturer and supplier shall maintain a record of shipment, which identifies the brand, lot or batch number and certified test data for each shipment. This data shall be made available to the contracting authority when requested.

Material suspected of being frozen shall be sampled and tested prior to use. Material older than 18 months shall be sampled and tested prior to use.

MANUFACTURER, BRAND NAME APPROVAL AND USAGE GUIDELINES

To obtain approval for a corrosion inhibitor, the manufacturer shall submit the following items to the Office of Materials in Ames, Iowa:

- Product identification including brand name and product number
- Complete manufacturer recommendations for usage
- Independent test data on the corrosion inhibitor showing compliance with the appropriate ASTM Specification
- A current Materials Safety Data Sheet (MSDS)
- A one-liter (one-quart) representative sample

Approval of corrosion inhibitors may be withdrawn because of deficient test results, product changes made after original approval, or unsatisfactory field performance.

Corrosion inhibitors shall meet the requirements of ASTM C 494 and those outlined herein. For calcium nitrite-based corrosion inhibitors, calcium nitrite content shall be approximately 30% by weight. For other types of corrosion inhibitors, approval will be based on testing in accordance with ASTM G 109, performed by an independent laboratory. When control specimens fail (average corrosion current = 10 µA), average corrosion current of specimens with corrosion inhibitor shall not exceed 5 µA. The dosage of a corrosion inhibitor used in a concrete batch shall follow manufacturer recommendations. The corrosion inhibitor may be used in conjunction with compatible retarding admixtures to control setting time and workability of the concrete. The sequence of addition of different chemical admixtures into the batch shall meet their compatibility requirements.

Approved manufacturer and brand names of corrosion inhibitors are listed in Appendix A.

AGITATION OF ADMIXTURES

If separating occurs, corrosion inhibitors shall be stirred, circulated or agitated thoroughly prior to operation of the proportioning plant to maintain the solids in suspension. The agitating shall be done in such a way that the solution in the holding or storage tank is circulated for a minimum of five minutes each day per 100 gallons (380 liters) or any fraction thereof. A circulating pump with one 250-watt (1/3 hp) pump motor and a 5/8 in. (16 mm) inside diameter hose will be considered as a minimum requirement. The engineer shall approve the method of agitation. Note that introducing air into a tank will not be acceptable.

CERTIFICATION

FOR MANUFACTURER

At the beginning of each calendar year, a certification form will be sent to each manufacturer. If the corrosion inhibitor to be supplied during that year is identical with the formulation previously tested and approved, then the manufacturer shall complete the Quality Control limits to be followed and return it to the Office of Materials in Ames, Iowa.

FOR DISTRIBUTOR

At the beginning of each calendar year, a certification form will be sent to each distributor. The distributor shall certify that the corrosion inhibitor to be supplied is not altered and will be distributed as received from the manufacturer.

MONITOR SAMPLING AND TESTING

Monitor samples will be obtained and sent to the Central Materials Laboratory for testing. Sampling frequency shall be according with IM 204. The sample size shall be one pint (0.5 liter). One acceptance sample per lot is necessary for each corrosion inhibitor. No project assurance samples are needed.

Samples will be tested for variation from the manufacturer target for solids, specific gravity and chloride ions.